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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,488	01/28/2002	Satoshi Shigematsu	96790p382	5883

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER	
VIEAUX, GARY	
ART UNIT	**PAPER NUMBER**
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/059,488	SHIGEMATSU ET AL.	
	Examiner	Art Unit	
	Gary C. Vieaux	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *5-10, 12-16, an 19-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,11,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/12/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on the following date is in compliance with the provisions of 37 CFR 1.97 and has been considered by the Examiner: April 12, 2007.

Amendment

The Amendment, filed April 26, 2007, has been received and made of record. In response to the most recent Office Action, dated January 5, 2007, claims 1-4, 11, and 17-18 have been amended. Claims 5-10, 12-16, and 19-20 were previously withdrawn.

Response to Amendment

In response to Applicant's amended independent claims 1 and 17, the claims are now found to be properly directed to the originally species as elected.

Further, the amended language of claims 1 and 17 is now found to cure the previously identified issues relating to the 35 U.S.C. 112, first paragraph, rejections. Therefore, the 35 U.S.C. 112, first paragraph, rejections to claims 1-4, 11, and 17-18 are hereby withdrawn.

Response to Arguments

Applicant's arguments filed April 26, 2007, have been fully considered but they are not persuasive.

Regarding claim 1, Applicant states that: "Hou discloses an image sensor that converts light intensity signals to digital signals without using A/D converters. Distinguishable, in Applicant's claimed invention the voltage-time conversion circuit changes its output level after a time corresponding to output voltage, which is analog data output from the sensor, has lapsed from a predetermined conversion operation start point of time and outputs one bit digital data. This enables long-distance propagation of a signal as one digital signal of H level or L level via a data bus. Therefore, precision of the data is prevented from being degraded" (Remarks, p. 9.)

Regardless of operation or improvement concerning degradation, the limitations of claim 1, as currently written, and are clearly readable on the Hou reference, in that Hou is found to discloses a data conversion/output apparatus comprising sensors (fig. 3 indicators 302-n), voltage-time conversion circuits which are arranged adjacent to said respective sensors and change output levels upon the lapse of times corresponding to output voltage values from said sensors after a conversion operation start point in order to convert voltage outputs of said sensors into times (fig. 3 indicators 312-n, col. 6 lines 41-44), and sensed data generation circuits for outputting, as digital data, lapse times until the output levels of said voltage-time conversion circuits change after a conversion start point (fig. 3 indicator 314-n, col. 6 lines 45-58), said sensed data generation circuits include a counter for counting a clock signal (fig. 3 indicator 311.)

Further, Applicant asserts that the Hou reference does not teach, disclose or suggest, "the counter is capable of operating independently of a pixel array and a maximum value of the counter is capable of being arbitrarily adjusted." (Remarks, p. 9.)

However, as to claim limitations wherein a "counter is *capable* of operating independently of a pixel array and a maximum value of the counter is *capable* of being arbitrarily adjusted" (emphasis added by Examiner), while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) The instant reference teaches the structural limitations of the apparatus as cited above, and in light of the lack of a definite structural relationship regarding the limitation relating to the counter, is found to meet the claim limitations as recited.

Based on the foregoing, the Examiner respectfully stands behind the 35 U.S.C. 102(e) rejection of claim 1, as currently written.

Regarding claim 17, although the wording is different, the material and related argument is considered substantively equivalent to that of claim 1, as discussed above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1-4 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Hou (US 6,578,145.)

Regarding claim 1, Hou discloses a data conversion/output apparatus comprising sensors (fig. 3 indicators 302-n), voltage-time conversion circuits which are arranged adjacent to said respective sensors and change output levels upon the lapse of times corresponding to output voltage values from said sensors after a conversion operation start point in order to convert voltage outputs of said sensors into times (fig. 3 indicators 312-n, col. 6 lines 41-44), and sensed data generation circuits for outputting, as digital data, lapse times until the output levels of said voltage-time conversion circuits change after a conversion start point (fig. 3 indicator 314-n, col. 6 lines 45-58), said sensed data generation circuits include a counter for counting a clock signal (fig. 3 indicator 311.)

As to claim limitations wherein a "counter is *capable* of operating independently of a pixel array and a maximum value of the counter is *capable* of being arbitrarily adjusted" (emphasis added by Examiner), while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) The instant reference teaches the structural limitations of the apparatus as cited above, and in light of the lack of a definite structural relationship regarding the limitation relating to the counter, is found to meet the claim limitations as recited.

Regarding claim 2, Hou discloses all of the limitations of claim 2 (see the 102(e) rejection to claim 1 supra), including disclosing a data conversion/output apparatus

further comprising control means for sequentially supplying outputs from said voltage-time conversion circuits to said sensed data generation circuits (col. 5 lines 30-44.)

Regarding claim 3, Hou discloses all of the limitations of claim 4 (see the 102(e) rejection to claim 1 supra), including wherein said sensors are arranged in a matrix together with said corresponding voltage-time conversion circuits to constitute respective pixels (fig. 3, in which indicator 302 and indicator 312 can be interpreted as one unit), and said data conversion/output apparatus further comprises group selection means for selecting, from the pixels in a column direction, pixels which are aligned in a row direction and connected to one of said sensed data generation circuits (fig. 3., col. 5 lines 30-44.)

Regarding claim 4, Hou discloses all of the limitations of claim 4 (see the 102(e) rejection to claim 3 supra), including wherein said sensed data generation circuit includes a latch circuit for latching a count value after the conversion operation start point of said counter upon reception of an output from the voltage-time conversion circuit of each group-selected pixel (fig. 3A indicator 314-n, col. 6 lines 45-51.)

Regarding claim 11, Hou discloses all of the limitations of claim 11 (see the 102(b) rejection to claim 3 supra), including wherein said sensed data generation circuit includes a counter for counting a clock signal (fig. 3A indicator 311), and a latch circuit for latching a count value of said counter after a point offset from the conversion operation start point upon reception of an output from said voltage-time conversion circuit of each group-selected pixel (fig. 3A indicator 314-n, col. 7 line 17 – col. 8 line 15.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being obvious over Simoni et al. (A Digital Camera for Machine Vision"; employing Applicant's disclosure of this prior art as provided in relation to Figure 12 of Specification) in view of Hou (US 6,587,145.)

Regarding claim 17, Simoni, employing Applicant's disclosure of this prior art as provided in relation to Figure 12 of Specification, discloses a data conversion/output apparatus including a column decoder for selecting at once a plurality of pixels aligned on an arbitrary column from pixels arrayed in a matrix (fig. 12 indicator 72), a plurality of data buses each commonly connected to a plurality of pixels aligned on each row out of the pixels (fig. 12 indicator 74), a counter for sequentially outputting count values in accordance with internal count operation (fig. 12 indicator 76), a plurality of latch circuits which are arranged on respective rows and latch the count values from said counter in accordance with level changes of said data buses corresponding to the respective rows (fig. 12 indicator 77), a row decoder for selecting a row having a desired pixel out of the pixels selected by said column decoder (fig. 12 indicator 73), and a plurality of row switches which are arranged on the respective rows and output as sensed data of

desired pixels the count values latched by said latch circuits corresponding to the respective rows (fig. 12 indicator 75), wherein each of the pixels has a sensor for outputting a detection result as an output voltage value (fig. 12 indicator 73), and a column switch for outputting in accordance with selection of a pixel by said row decoder an output to a data bus connected to the pixel (Specification – fig. 12 indicator 63.) However, Simoni does not disclose a voltage-time conversion circuit for changing an output level upon the lapse of time corresponding to an output voltage value from said sensor after a predetermined conversion operation start point.

Nevertheless, Hou discloses a data conversion/output apparatus that includes a voltage-time conversion circuit that changes an output level upon the lapse of time corresponding to an output voltage value from said sensor after a predetermined conversion operation start point (col. 3 line 4 col. 4 line 52.) It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the voltage-time conversion circuit of the data conversion/output apparatus as taught by Hou with the data conversion/output apparatus as taught by Simoni, in order to produce signals of higher fidelity, as well as to accomplish A/D conversion within a pixel without requiring each pixel to have the extra circuitry and costs associated with conventional A/D circuits ('030 – col. 1 lines 33-62.)

As to claim limitations wherein a "counter is *capable* of operating independently of a pixel array and a maximum value of the counter is *capable* of being arbitrarily adjusted" (emphasis added by Examiner), while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be

distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) The instant reference teaches the structural limitations of the apparatus as cited above, and in light of the lack of a definite structural relationship regarding the limitation relating to the counter, is found to meet the claim limitations as recited.

Regarding claim 18, Simoni and Hou disclose all of the limitations of claim 17 (see the 103(a) rejection to claim 17 supra), including disclosing a data conversion/output apparatus further comprising a plurality of output-side latch circuits which are interposed between said latch circuits and said row switches for the respective rows, latch outputs from said latch circuits in accordance with a predetermined data reception signal, and output the outputs to said switches (Figure 12 of Specification, indicator 77.)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary C. Vieaux whose telephone number is 571-272-7318. The examiner can normally be reached on Monday - Friday, 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen T. Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gary C. Vieaux
Examiner
Art Unit 2622

Gcv2

NGOCYEN VU
SUPERVISORY PATENT EXAMINER